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EXAMINER

STEVENS, THOMAS H

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

87

Office Action Summary

Application No.

09/847,535

Applicant(s)

BOND ET AL

Examiner

Thomas H. Stevens

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42, 45 and 46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42, 45 and 46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-46 were previously examined.
2. Claims 43 and 44 are now cancelled.
3. Claims 1-42, 45-46 were examined.

Section I: Response to Applicants' Arguments (1st Office Action)

Restriction

4. Action by applicants to cancel claims 43-44 was completed and acknowledged by the Office.

Specification

5. Applicants are thanked for addressing this issue. Objection is withdrawn.

Claim Objections

6. Applicants are thanked for addressing this issue. Objections are withdrawn.

35 USC § 102

7. Applicants are thanked for addressing this issue. Applicants state the Scalzi (U.S. Patent 5,560,013 (1996)) reference doesn't disclose kernel of an operating system. According to Microsoft Press Computer User's Dictionary, 1998 edition, a kernel is defined (pg. 201) as *the core of an operating system—the portion of the system that manages memory, files and peripheral devices; maintains the time and date; launches application; and allocates system resources*. Scalzi defines the core operating systems as the "target system" that is defined (abstract) as *efficiently stores the translated executable source programs by actually storing only one copy of any*

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*source program, regardless of the number of source address spaces in which the source program exists. **The target system efficiently manages dynamic changes in the source machine storage, accommodating the nature of a preemptive, multitasking source operating system.** The target system preserves the security and data integrity for the source programs on a par with their security and data integrity obtainable when executing in source processors (i.e. having the source architecture as their native architecture). The target computer execution maintains source-architected logical separations between programs and data executing in different source address spaces—without a need for the target system to be aware of the source virtual address spaces.* Summarily, both terms are defined as the managing source of the computer (highlight emphasized), thus equating the same purpose.

Applicants state Scalzi doesn't disclose interception of a kernel call or kernel emulation. Based on the latter analysis of equivalence between kernel and target system examiner argues the kernel call as inherent for the simple reason that if a translation function is an event between nativity and non-native functions then a call is understood as an integral part to the translation function (Scalzi: column 5, lines 9-11, "instruction translation"; column 5, lines 38-40). Base on the previous analysis, the rejection stands.

35 USC § 103

8. Applicants are thanked for addressing this issue. Applicants argue the Duvall reference lack of teaching of "limiting available memory to a range that is addressable".

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Examiner refutes arguments by the thought process of if memory is addressable than its addressable, whether it's limiting is moot.

Applicants state the Duval reference doesn't disclose non-native or emulator. The specification discloses examples of what non-native is (i.e., 32 bit application can't run on 64-bit environments, pg. 4, line 11); summarily, incompatible computer bit applications associated to their processing bit environment. Based on the previous analogy, Duval is conducting the same event by which a 40-bit address is formulated to a 12-bit address (column 4, lines 37-60) or non-native. While the Duval reference suggest the term emulation (column 39, line 39), the reference has merit since it would be advantageous to use McCoy to modify Duvall since *a proliferation of many software programs has led to a lack of uniformity in the way in which data is formatted...and the presence of functions or operations which are unique to each program* (column 1, lines 45-50), *despite the fact that processors are operating at ever increasing speeds and efficiencies...nevertheless there's a finite delay between the time the operator request a document for conversion processing* (column 2, lines 45-50).

Thus rejection stands.

Section II: Final Rejection (2nd Office Action)

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1,3-6,9-13,15-17,19-28, 34,37-40,42,45-46** are rejected under 35 U.S.C. 102(b) as being anticipated by Scalzi et al (U.S. Patent Number 5,560,013), herein referred to as **Scalzi**.

3. As to **Claims 1,3,4,13,15,16,34, 40 and 45**, **Scalzi** teaches: a kernel emulator for non-native program modules, the emulator comprising: an interceptor configured to intercept kernel calls from non-native program modules (**Figure 1, element 102 and description**); a call-converter configured to convert non-native kernel calls intercepted by the interceptor into native kernel calls (**Figure 1, element 103 and description**); wherein the call-converter comprises: an instruction-translator configured to translate non-native CPU instructions into native CPU instructions (**Figure 1, element 103 and description**); an address-translator configured to translate addresses from non-native length into native length (**Figure 3 and description, column 21, lines 42-48**).

4. As to **Claim 5**, **Scalzi** teaches: an emulator as recited in claim 1, wherein the call-converter comprises an argument-converter configured to convert non-native argument format into native argument format (**Figure 3 and description, column 21, lines 42-48**).

5. As to **Claim 6,17 and 37**, **Scalzi** teaches: an emulator as recited in claim 1, wherein the call-converter comprises a translator configured to translate words from

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non-native word size into native word size (**Figure 3 and description, column 21, lines 42-48**).

6. As to **Claims 9 and 19**, **Scalzi** teaches: an emulator as recited in claim 1 further comprising a shared-memory manager configured to synchronize a native shared data structure with a non-native shared data structure (**column 18, lines 46-65**).

7. As to **Claims 10, 20-25**, **Scalzi** teaches: an emulator as recited in claim 1 further comprising a shared-memory manager configured to manage memory space that is accessible to both native and non-native program modules, wherein the shared-memory manager maps versions of process shared data structures (SDSs) and versions of thread shared data structures (SDSs) between native and non-native program modules (**column 1, lines 23-25, column 2, lines 54-62, column 3, lines 9-22, column 5, lines 4-16**) wherein the processes shared data structures include environmental conditions of the machine and the thread shared data structure is encompassed by the control programs.

8. As to **Claims 11, 42 and 46**, **Scalzi** teaches: an operating system on a computer-readable medium, comprising: a native kernel configured to receive calls from native program modules (**column 17, line 56-57**); a kernel emulator as recited in claim 1 configured to receive calls from non-native program modules (**Figure 1, element 102 and description**).

9. As to **Claim 12**, **Scalzi** teaches: an operating system on a computer-readable medium, comprising: a native kernel configured to receive calls from native APIs

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(column 17, line 56-57); a kernel emulator as recited in claim 1 configured to receive calls from non-native APIs (**Figure 1, element 102 and description**).

10. As to **Claims 26,27,28,38,39** Scalzi teaches: a computer comprising one or more computer-readable media having computer-executable instructions that, when executed by the computer, perform the method as recited in claim 13 (**Figure 1, element 102 and description**) and an operating system embodied on a computer readable medium (**column 3, lines 32-39**).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. **Claims 2 and 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Scalzi** as applied to Claim 1 above, and further in view of Franz (Michael Franz, "Emulating an Operating System on Top of Another" Software - Practice and Experience. Vol. 23, No. 6, June 1993, pp. 677-692), herein referred to as **Franz**.

14. As to **Claims 2 and 14**, **Scalzi** teaches: a call converter comprising an instruction-translator configured to translate non-native CPU instructions into native CPU instructions (**Figure 1, element 103 and description**).

15. **Scalzi** does not expressly teach the call-converter comprises a translator configured to translate a non-native paradigm for passing parameters into a native paradigm for passing parameters.

16. **Franz** teaches: an emulator as recited in claim 1, wherein the call-converter comprises a translator configured to translate a non-native paradigm for passing parameters into a native paradigm for passing parameters (**page 681, paragraph 4, "boot loader"**) as a method to enable the emulation of one operating system on top of the other. **Franz** teaches that incompatible paradigms are one of the major hurdles that needs to be overcome in order to emulate one system on top of the other (**page 678, "Barriers to Portability"**).

17. It would have been obvious at the time the invention was made to modify the call converter as taught in **Scalzi** to further include the translation of paradigms as taught by

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Franz since **Franz** teaches that incompatible paradigms are one of the major hurdles that needs to be overcome in order to emulate one operating system on top of the other (page 678, "Barriers to Portability").

18. **Claims 7, 8, 18, 35 and 41** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Scalzi** as applied to Claim 1 above, and further in view of **Duvall et al** (U.S. Patent Number 4,742,447), herein referred to as **Duvall**.

19. As to **Claims 7, 8, 18, 35 and 41**, **Scalzi** teaches a block of memory configured as a range addressable by non-native program modules (**Figure 1, element 109**) and memory space that is accessible to both native and non-native modules (**Figure 1, "Target Real"** wherein the target storage is part of the physical storage of the native platform).

20. As to **Claims 35 and 41**, **Scalzi** teaches: translating non-native CPU instructions into native CPU instructions (**Figure 1, element 103 and description**); translating addresses from non-native length into native length (**Figure 3 and description, column 21, lines 42-48**).

21. **Scalzi** does not expressly teach: a memory constrainer configured to limit addressable memory to a range addressable by non-native program modules or a memory manger configured to manage memory space that is accessible to both native and non-native program modules.

22. **Duvall** teaches a memory constrainer configured to limit addressable memory to a range addressable by non-native program modules (**column 4, lines 43-46, column 6, lines 25-29, column 9, lines 20-25**) or a memory manger configured to manage

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memory space that is accessible to both native and non-native program modules (**Figure 1, element 13, column 9, lines 21-25**). **Duvall** teaches this method for virtual machines running different operating systems in a UNIX environment (**column 8, line 65-column 9, line 3**), virtual memory (**Figure 3**) and binary address translation (**column 9, lines 26-38**).

23. Both **Scalzi** and **Duvall** are directed to virtual machines and the use of virtual storage as well as binary address translation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention as taught by **Scalzi** to further include limiting the addressable range and providing a memory manager as taught by **Duvall** since both **Scalzi** and **Duvall** are directed to virtual machines and virtual memory.

24. **Claim 36** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Scalzi** and **Duvall** as applied to claim 35 above, and further in view of **Franz**.

25. As to **Claim 36**, **Scalzi** and **Duvall** teach: a call converter comprising an instruction-translator configured to translate non-native CPU instructions into native CPU instructions (**Scalzi: Figure 1, element 103 and description**).

26. **Scalzi** and **Duvall** do not expressly teach translating a non-native paradigm for passing parameters into a native paradigm for passing parameters.

27. **Franz** teaches: an emulator as recited in claim 1, wherein the call-converter comprises a translator configured to translate a non-native paradigm for passing parameters into a native paradigm for passing parameters (**page 681, paragraph 4, "boot loader"**) as a method to enable the emulation of one operating system on top of

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the other. **Franz** teaches that incompatible paradigms are one of the major hurdles that needs to be overcome in order to emulate one system on top of the other (**page 678, "Barriers to Portability"**).

28. It would have been obvious at the time the invention was made to modify the call converter as taught in **Scalzi and Duvall** to further include the translation of paradigms as taught by **Franz** since **Franz** teaches that incompatible paradigms are one of the major hurdles that needs to be overcome in order to emulate one operating system on top of the other (**page 678, "Barriers to Portability"**).

29. **Claims 29-33 are** rejected under 35 U.S.C. 103(a) as being unpatentable over **Duvall** and further in view of McCoy et al (U.S. Patent Number 5,036,484), herein referred to as **McCoy**.

30. **As to Claim 29, Duvall teaches:** a method comprising: if the initiating program is non-native: limiting available memory to a range that is addressable by the non-native program module (**column 4, lines 43-46, column 6, lines 25-29, column 9, lines 20-25**); establishing non-native a version of a shared memory data structure that may be synchronized with a native version of the same shared memory data structure (**column 5, lines 45-51, column 6, lines 25-29**).

31. **Duvall** further teaches the data in a segment of virtual memory is created as a result of an application program being run (**column 5, lines 52-55**). While this implies that must be some determination as to whether a program is native or non-native allowing for the segment in virtual memory to be created, **Duvall** does not expressly teach determining whether an initiating program module is a native or non-native.

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32. **McCoy** teaches determining whether an initiating program module is a native or non-native (**Figure 3a, element 36a, column 5, lines 40-48**) in a system that emulates a host program in a PC environment and translates host data to PC format by the emulation program (**column 5, lines 28-31**), allowing the system to know whether to perform a function of the native system or perform a function of the non-native system which includes the translation of code (**Figure 3a, element 31a and column 5, lines 40-48**) since in the emulation systems of the prior art, when operating in emulation mode, the native system is incapable of performing functions other than those of the terminal which is being emulated. Therefore, the functions of the personal computer are not available in the emulation mode (**column 1, lines 32-39**).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify since it would be advantageous to use McCoy to modify Duvall since a proliferation of many software programs has led to a lack of uniformity in the way in which data is formatted...and the presence of functions or operations which are unique to each program (column 1, lines 45-50), despite the fact that processors are operating at ever increasing speeds and efficiencies...nevertheless there's a finite delay between the time the operator request a document for conversion processing (column 2, lines 45-50).

33. As to **Claim 30, Duvall and McCoy** teach: a method as recited in claim 29 further comprising: intercepting kernel calls from the non-native program module; converting the intercepted non-native kernel calls into native kernel calls (**Duvall: column 9, lines 26-41, McCoy, Figure 3a, elements 31a and 36a**).

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34. As to **Claim 31, Duvall and McCoy** teach: a method as recited in claim 29 further comprising emulating a non-native kernel for which kernel calls from the non-native program module are intended (**Duvall: column 8, line 62-column 9, line 6, McCoy: Figure 3, element 35**).

35. As to **Claim 32, Duvall and McCoy** teach: a computer comprising one or more computer-readable media having computer-executable instructions that, when executed by the computer, perform the method as recited in claim 29 (**Duvall: column 8, lines 50-54, line 62-column 9, line 3, McCoy, column 4, lines 30-33**).

36. As to **Claim 33, Duvall and McCoy** teach: a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 29 (**Duvall: column 8, lines 50-54, line 62-column 9, line 3, McCoy, column 4, lines 30-33**).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Leo Picard at (571) 272-3749. Central Fax number is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

July 7, 2005


Paul L. Rodriguez 7/8/05
Primary Examiner
Art Unit 2123

THS